

**MINISTRY OF
EDUCATION AND TRAINING**

MINISTRY OF CONSTRUCTION

HANOI UNIVERSITY OF ARCHITECTURE

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ĐÀO PHƯƠNG NAM

**MANAGEMENT OF SPACE, ARCHITECTURE, LANDSCAPE
COASTAL URBAN IN QUANG NINH PROVINCE**

**PHD THESIS
SPECIALIZED IN URBAN AND CONSTRUCTION MANAGEMENT**

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Scientific instructor: Prof.Dr. Nguyen To Lang

Reviewer 1: Professor. Dr. Do Hau

Reviewer 2: Associate Professor, PhD. Nguyen Dinh Thi

Reviewer 3: Associate Professor, PhD. Luong Tu Quyen

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INTRODUCTION

1. The urgency of the subject matter

Quang Ninh is an important growth pole in the Northern Key Economic Region of the Red River Delta, and is also one of Vietnam's four major tourist centers with the world natural heritage of Ha Long Bay that has been recognized twice by UNESCO for its aesthetic, geological and geomorphological value. By 2023, Quang Ninh will be the province that has achieved the first Provincial Competitiveness Index (CPI) in Vietnam for 6 consecutive years. Quang Ninh is a center for industrial and port development; sea, services, tourism of the Northern key economic region; is an international tourism center and a national energy supply center; is the region's gateway to the sea and internationally. Currently, Quang Ninh Province has five coastal urban areas: Ha Long city, Cam Pha city, Mong Cai city, Quang Yen town, Cai Rong town (Van Don) which are key development areas. Travel in the Red River Delta and Northeast Coast.

In recent years, the coastal urban system of Quang Ninh province has gradually been improved in terms of urban planning and infrastructure investment. However, for Quang Ninh province, the management of space, architecture, and urban landscape in general has not been given due attention, so it has not met the management and development requirements; The system of regulations and management regulations on landscape architecture in the coastal area of Quang Ninh still has many shortcomings, overlaps in subjects of regulation with different documents, and has not created a favorable environment for mobilize all resources to promote economic development. Many projects are concentrated along the coast, leading to inappropriate hill leveling and sea filling, negatively impacting the environment, space, architecture, and landscape. The ecological environment pollution is still serious. Land use planning is not close to reality, causing land waste and land use for wrong purposes. The establishment of regulations on management of planning and architecture in coastal areas and their implementation according to the regulations are not serious; Many projects are being built slowly or are being implemented while there are still problems in legal procedures, causing frustration in public opinion, negatively affecting the urban landscape and architectural space and thus negatively affecting the urban landscape. to the lives of people in these urban areas.

For Quang Ninh province, as one of the provinces with a large coastal length in Vietnam, the province is directly affected by climate change issues, especially issues of sea level rise, landslides and storms and floods. According to the urban master planning orientation of Quang Ninh province to 2025, vision to 2050, there will be 50% of the urban population by 2050, most important urban areas are located in coastal areas, and are closely linked to the marine economy [87]. The urbanization process and the expansion of residential areas into areas at risk of natural disasters pose many risks while urban infrastructure has not yet promoted the needs of urban development. To effectively manage the coastal area, in addition to tightening the management of coastal space, architecture and landscape, Quang Ninh needs to identify, evaluate and apply the integration of construction planning content with adapt to climate change.

Up to now, there have been a number of research topics on management of construction planning in coastal areas, however, the topics exploit the aspects of planning management of coastal tourist areas, or research on ecological environment, technical infrastructure, public works... without focusing on analyzing aspects of space management, architecture, and coastal urban landscape. Therefore, the thesis topic "**Management of space, architecture, coastal urban landscape in Quang Ninh province**" fully reflects the necessity, scientific and practical significance of the topic, aims to improve the quality of space, architecture and landscape management, contributing to the sustainable development of coastal urban areas.

2. Purposes of the research

Proposing solutions for managing space, architecture, and coastal urban landscape of Quang Ninh Province to create unity in the management of space, architecture, and urban landscape, promoting traditional values, at the same time Preserving the cultural identity of coastal cities, improving people's quality of life, contributing to the socioeconomic development of Quang Ninh Province.

3. Object and scope of the research

Object of the research:

Management of space, architecture, and coastal urban landscape in Quang Ninh province with climate change in mind

Scope of the research:

- In terms of space: Coastal urban areas of Quang Ninh Province (Ha Long city, Cam Pha city, Mong Cai city, Quang Yen town, Cai Rong - Van Don town).
- In terms of time period: Orientation to 2030 and vision to 2050

4. Method of the research

To achieve the proposed research objectives, in addition to research methods such as synthesis, analysis, comparison, the thesis mainly used two methods of qualitative research and quantitative research to determine research results.

5. Results of the research

The researcher has assessed the current status of space, architecture, and coastal urban landscape management in Quang Ninh Province. Evaluate the main impacts of climate change on space, architecture, and landscape management in Quang Ninh. At the same time, identify and propose solutions to improve the effectiveness of space, architecture, and landscape management in coastal urban areas of Quang Ninh Province.

6. Scientific and practical implications

Scientific implications

The research results of the project contribute to perfecting and supplementing scientific theories on space management, architecture, and landscape for urban areas in Vietnam.

Practical implication

The thesis's proposals will contribute to improving policy mechanisms in space, architecture, and landscape management for coastal cities and can be applied in practice.

7. New contributions of the thesis

The thesis has identified 9 groups of key factors affecting the management of space, architecture, and coastal urban landscape in Quang Ninh province.

Proposing a set of criteria for better managing space, architecture, and coastal urban landscape in Quang Ninh province.

Propose 7 packages of solutions to more effectively managing space, architecture, and coastal urban landscape in Quang Ninh province with attention to climate change adaptation.

Pilot application of research results on space, architecture and landscape management for Ha Long city

8. Some concepts and terms

- **Architecture, spatial landscape:** Architecture, landscape created by physical structures, roads that act as space limits, within space and/or by the connection of elements other municipalities related to it. Architecture and spatial landscape include architecture, natural landscape and artificial landscape [48]

- **Coastal urban (Sea urban):** Coastal urban areas include a collection of urban areas located in coastal plains that are directly or indirectly related to the sea. Coastal urban areas are not just narrow spaces of each specific urban spot, but are large spaces covering many urban areas, called coastal urbanization areas. [37]

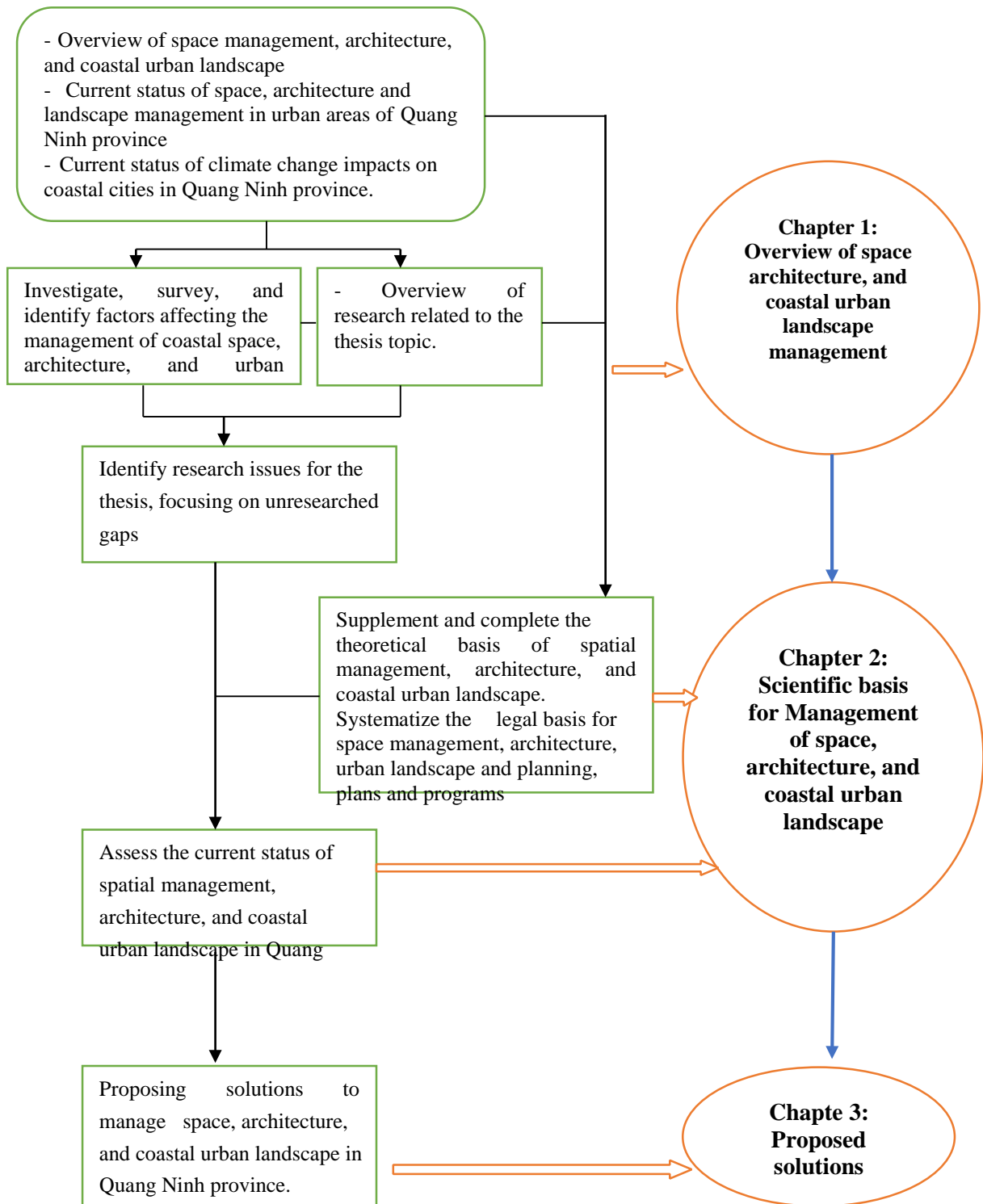
- **Space, architecture, urban landscape management:** is a systematic state management activity to ensure consistency in management from the overall urban area to specific spaces; inherits architecture and urban landscape; suitable for natural conditions and characteristics, respecting local customs and culture; promote traditional values to preserve the identity of each region in architecture and urban landscape. [48]

9. Thesis structure

The thesis consists of three parts: Introduction, Content, Conclusion and recommendations. The thesis content includes 3 chapters:

- Chapter 1: Overview of spatial management, architecture, and coastal urban landscape in Quang Ninh province
- Chapter 2: Scientific basis for managing space, architecture, and coastal urban landscape in Quang Ninh province
- Chapter 3: Solutions for managing space, architecture, and coastal urban landscape in Quang Ninh province

Research diagram showing the main contents of the thesis topic Figure 1.



CONTENT CHAPTER 1: OVERVIEW OF SPACE, ARCHITECTURE, AND URBAN LANDSCAPE MANAGEMENT IN THE COASTAL OF QUANG NINH PROVINCE

1.1. Overview of space management, architecture, and coastal urban landscape

1.1.1. Overview of space management, architecture, and coastal urban landscape

According to United Nations statistics, globally, coastal areas represent 20% of the total surface area of the earth, the majority of residents in this area are also concentrated in coastal urban areas. Over a long period of time, many coastal cities in the world today have developed on a large scale, even extremely large.

1.1.2. Overview of spatial management, architecture, and coastal urban landscape in Vietnam

Vietnam's coastal area is divided into 3 main regions as follows:

(1) Northern coastal area: includes 5 provinces of Quang Ninh, Hai Phong, Thai Binh, Nam Dinh, Ninh Binh with a population of about 8.656 million people.

(2) The Central Coast includes 14 provinces and cities: Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Quang Tri, Thua Thien Hue, Da Nang, Quang Nam, Quang Ngai, Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan, Binh Thuan, population about 21.427 million people.

(3) The Mekong Delta region includes 13 provinces and cities: Can Tho, Long An, Tien Giang, Ben Tre, Dong Thap, Vinh Long, Tra Vinh, Hau Giang, Soc Trang, Bac Lieu, Ca Mau, Kien Giang. Population 17.204 million people.

1.2. Overview of Quang Ninh province and coastal urban areas of Quang Ninh province

1.2.1. Overview of Quang Ninh province

In the economic development planning, Quang Ninh belongs to both the northern key economic region and the Northern coastal region. This is Vietnam's main coal mining province and Ha Long Bay is a world heritage and natural wonder.

Quang Ninh province has 13 district-level administrative units, including 4 cities, 2 towns and 7 districts with 177 commune-level administrative units, including 72 wards, 7 towns and 98 communes [94]..

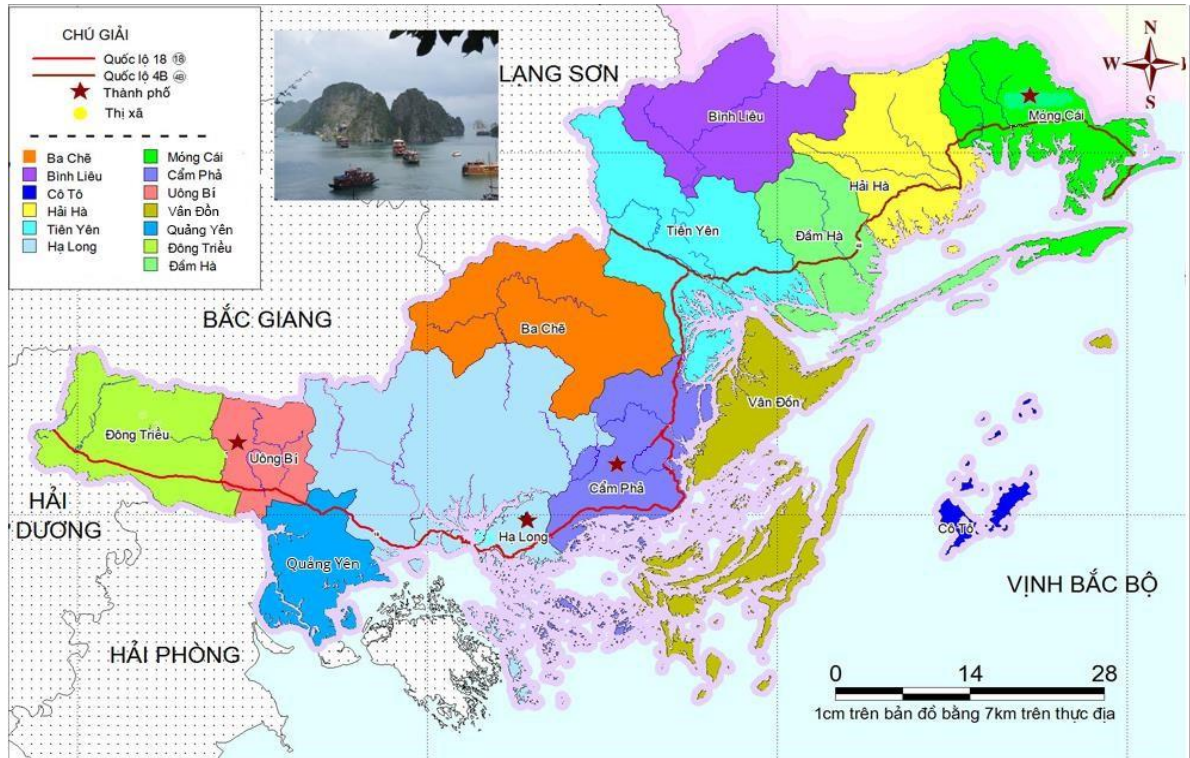


Figure 1.8. Map of Quang Ninh province

[Source: People's Committee of Quang Ninh province, 2022]

1.2.2. Overview of coastal urban areas in Quang Ninh province

Coastal urban areas of Quang Ninh province are urban areas with a part of the area directly adjacent to the sea. Some unique features of coastal urban areas of Quang Ninh Province are specifically as follows:

Table 1.4. Summary table of coastal urban hierarchy in Quang Ninh province

No	City	Urban type (2010)	Realistic urban type (2020)	Note
1	Ha Long City	II	I	Provincial city
2	Mong Cai City	III	II	Provincial city
3	Cam Pha City	III	II	Provincial city
4	Quang Yen City	V	III	Town (under the province)
5	Cai Rong town (District Vân Đồn)	V	IV	Districts

1.3. Current status of space, architecture, and landscape of coastal urban areas in Quang Ninh province

1.3.1. Current status of spatial distribution of coastal cities

Quang Ninh's coastal urban space is determined in the direction of expansion, the province's key coastal tourism centers are: Ha Long; Quang Yen; Van Don; Cam Pha and Mong Cai. Tourist areas and destinations are gradually receiving investment

attention. Up to now, most localities have been recognized as tourist routes and destinations. The scope of the study includes 5 coastal cities: 1. Ha Long; 2. Cam Pha; 3. Van Don; 4. Mong Cai; 5. Quang Yen. The coastal urban landscape belt is shown in Figure 1.10.

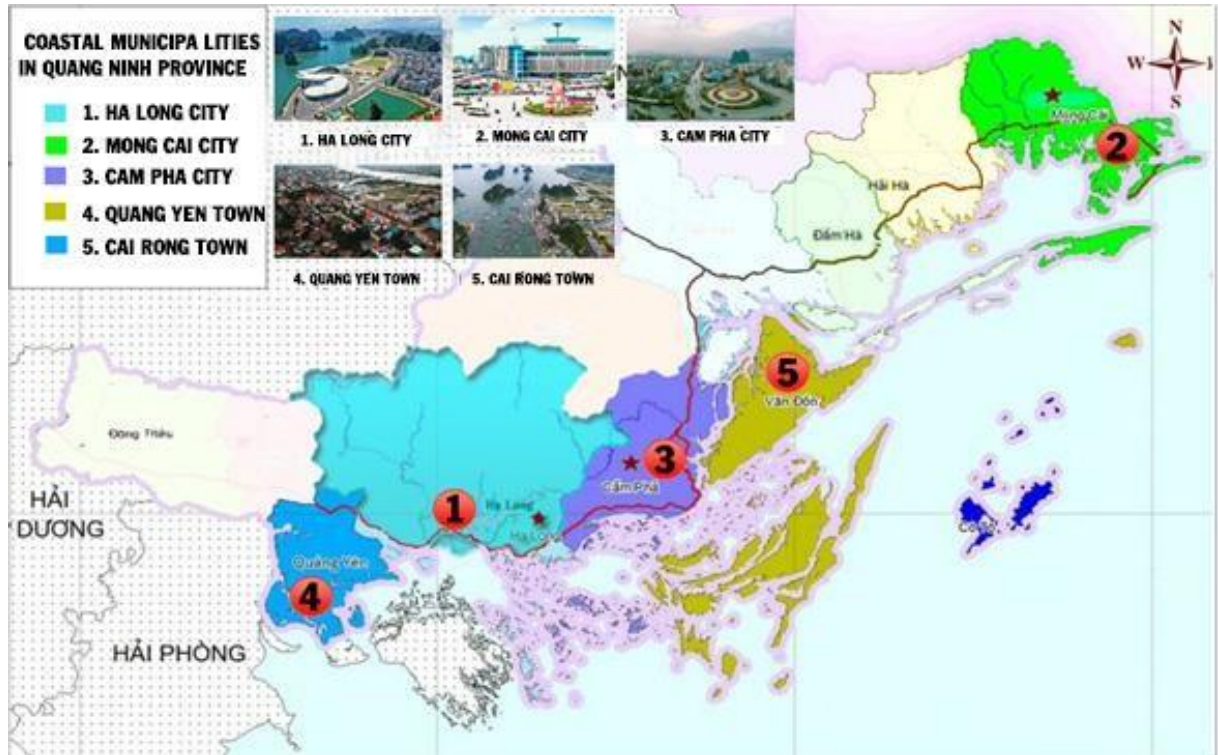


Figure 1.10. Map of coastal urban spaces in Quang Ninh province, [87]

1.3.2. Space, architecture, landscape of coastal cities

- Spatial organization: In general, urban areas have complied with land use norms according to approved planning. However, there are still some violations in the implementation process.
- Coastal urban landscape system: The coastal urban landscape system of Quang Ninh province is mainly developed along routes and located on arterial traffic routes where land conditions are favorable, or associated with areas with natural resources. development in tourism, services, coal mining, industry, seaports or at the center of district-level administrative units.
- Urban highlight works: Typical architectural works that are symbols of Quang Ninh Province serve as highlights, forming the landscape to promote these works.
- Cultural works and conservation areas: Quang Ninh coastal urban system possesses a rich and unique cultural heritage system.
- Green space and water surface: Currently, green space in the zones is located in the central core and in public and service areas, connected to all other infrastructure systems in the zone..

1.4. Current status of space, architecture and landscape management in coastal urban areas of Quang Ninh province

1.4.1. Promulgation and implementation of legal documents on planning and architecture

Currently, there is only Decision No. 4331/QĐ-UBND of the Province dated December 31, 2015 on promulgating management regulations according to the general planning project for construction of Cam Pha city to 2030, with a vision to 2050 and beyond. 2050 was issued, in addition, other urban areas do not have specific regulations on management according to planning..

1.4.2. Organize the state apparatus for managing space, architecture, and landscape of coastal cities

Tại Quảng Ninh, trách nhiệm quản lý toàn diện về KGKTCQ do UBND Tỉnh và UBND các thành phố, huyện trực thuộc chịu trách nhiệm.

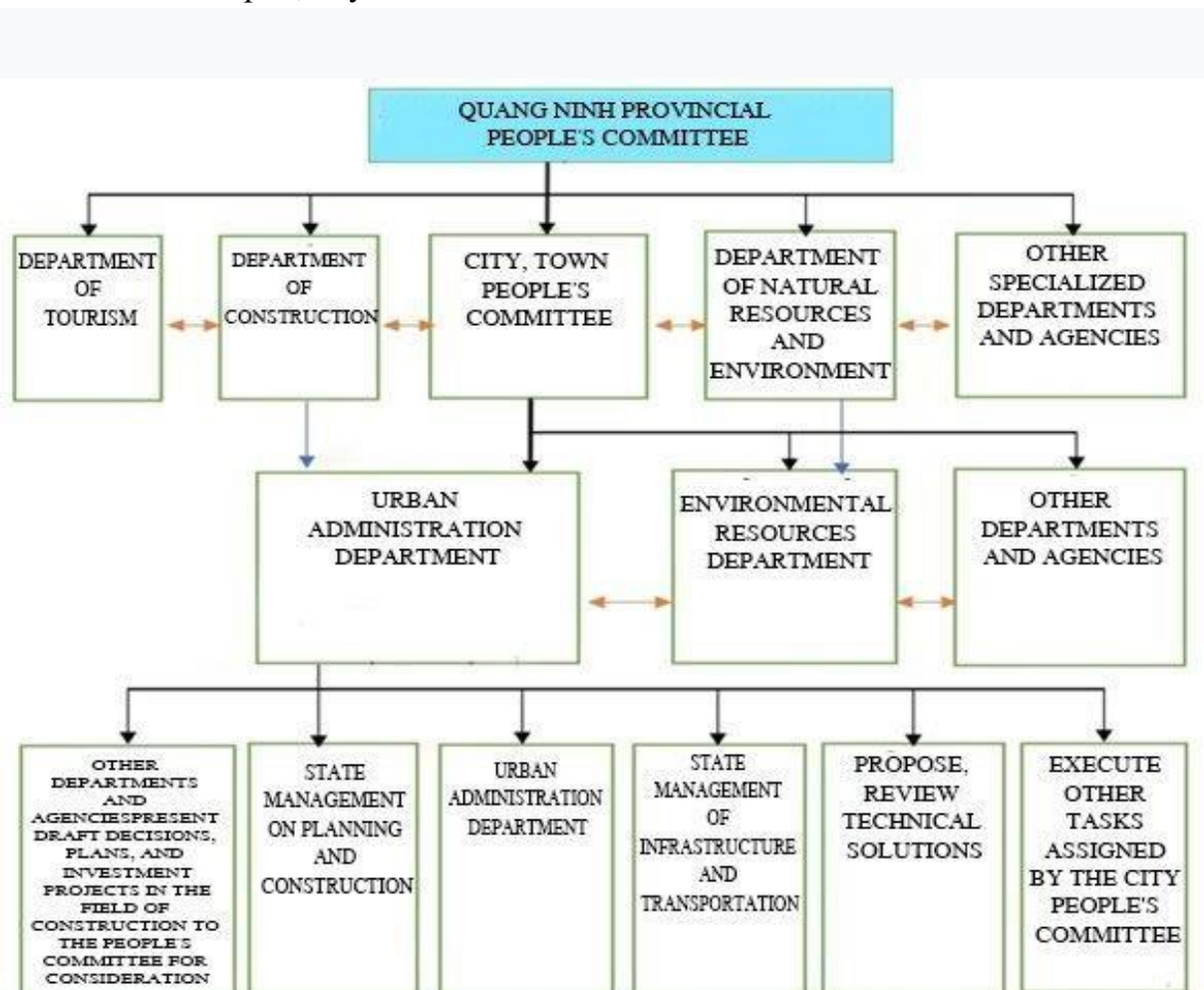


Figure 1.17. Urban management structure diagram

1.4.3. Current status of coastal urban system planning

Up to now, urban areas in the Province have completed the general planning of 13/13 urban areas reaching 100%. Local zoning planning reached 56.6%. Detailed construction planning of localities reached 56.9%. The work of detailed construction planning and urban design has been strengthened. Localities seriously implement the announcement and publicization of approved urban construction planning projects.

1.4.6. Community participation in space, architecture and landscape management

The work of announcing and publicizing the planning and collecting opinions from the community is not taken seriously, most of it is only formal... People's opinions have not been fully absorbed, so it is not highly effective in contributing to the project. Provide comments before and after making the decision to approve the Planning.

1.5. Current status of climate change impacts on coastal urban areas in Quang Ninh province

Quang Ninh is located in the Gulf of Tonkin region, is a coastal province in a climate change sensitive area and is highly vulnerable to sea level rise, storms, and tropical depressions. Quang Ninh is directly affected by unusual extreme weather phenomena as well as other manifestations of climate change such as increased temperature, rainfall and sea level rise.

During the period from 1961 to 2018, the average annual air temperature in Quang Ninh increased approximately 0.2oC/decade, the average sea level also increased about 0.25 cm/year according to data from stations. oceanography and 0.33 cm/year according to satellite data. Quang Ninh is also significantly involved in climate change with significant greenhouse gas emissions from coal mining and coal thermal power activities..

1.6. General assessment of the management of space, architecture, and landscape of coastal urban areas in Quang Ninh province

1.6.1. Result

- Urban public spaces are increasingly developed and expanded; develop many new urban areas; Completed many public, cultural and sports works; green Park...; The urban face has many improvements, creating highlights for the city (Square, Central Park, Cultural Palace; People's Committee headquarters...).

- In urban areas where the Urban Management Department has been established and some urban areas have an Architectural Design Planning Center or Project Management Board, the management of public spaces is more focused and clearly defined.

1.6.2. Limitations exist

- The management apparatus of coastal urban economic zones still has many limitations, lacking decentralization and reasonable assignment of functions to specialized departments in the management of urban economic space planning.

- The adjustment of general construction planning and coverage of detailed urban construction planning has not kept pace with urban growth, and has not met the

requirements for construction licensing and urban construction management. according to planning.

1.7. Research projects related to the thesis topic

1.7.1. Research around the world

The author has synthesized, analyzed and evaluated research projects related to the thesis topic including: 02 research projects related to space and coastal urban landscape architecture; 01 research project related to climate change and 03 research projects related to spatial management, architecture, and coastal urban landscape

1.7.2. Research in Vietnam

The author has synthesized, analyzed and evaluated research projects related to the thesis topic including: 03 research projects related to space and urban landscape architecture; 01 research project related to urban areas and climate change and 03 research projects related to management of coastal urban space management.

1.7.3. Comprehensive evaluation of research works related to the thesis topic

(1) Results achieved

Most domestic and foreign studies confirm that long-term sustainability of coastal urban areas depends on preserving and enhancing the environment as well as enhancing its spatial system and landscape architecture. The risks from the impacts of global climate change are a huge challenge for spatial management and coastal urban landscape architecture to adapt to climate change.

(2) Existence and limitations

Research on space management, architecture, urban landscape in general and coastal tourism in particular is focusing largely on regions and a series of urban areas. Research on space, architecture, and landscape management issues for coastal cities is still a big gap in both theory and practice. There is no complete research project that specifically studies on spatial management, architecture, and coastal urban landscape to adapt to climate change.

1.8. Issues that need to be researched in the thesis

- Systematize the theoretical and practical basis related to coastal tourism urban development in the world and Vietnam to gain general knowledge about spatial management, architecture, and coastal urban landscape, adapt to climate change, and at the same time draw experiences and directions for research as well as core goals when conducting research on spatial management, urban landscape architecture and coastal tourism in Quang Ninh province.

- Identify factors affecting the management of space, architecture, and coastal urban landscape in Quang Ninh province

- Propose a set of criteria for managing coastal space, architecture, and urban landscape.

- Provide solutions to manage space, architecture, and coastal urban landscape in Quang Ninh Province with attention to climate change. Research and pilot application of results achieved on space, architecture, and landscape management in Ha Long City to see: The feasibility of the solution as well as the effectiveness and

practicality of management Manage coastal space, architecture, and urban landscape with attention to climate change.

CHAPTER 2: SCIENTIFIC BASIS OF SPACE, ARCHITECTURE, COASTAL URBAN LANDSCAPE MANAGEMENT

2.1. Scientific basis

2.1.1. Management of space, architecture, and coastal urban landscape

- *Architectural organization and urban landscape:* Roger Trancik's theory of architectural organization and urban spatial landscape is: Background theory; Connection Theory and Place Theory address user needs, local culture, and historical social context in design.

- *Management of space, architecture, and landscape:* Management of space, architecture, and urban landscape is a state management content in the fields of urban management. The position of space, architecture, and urban landscape management belongs to block 2 in the Government's management content. The content of state management of space, architecture, and landscape is implemented in steps from zoning to management, building management content and targets.

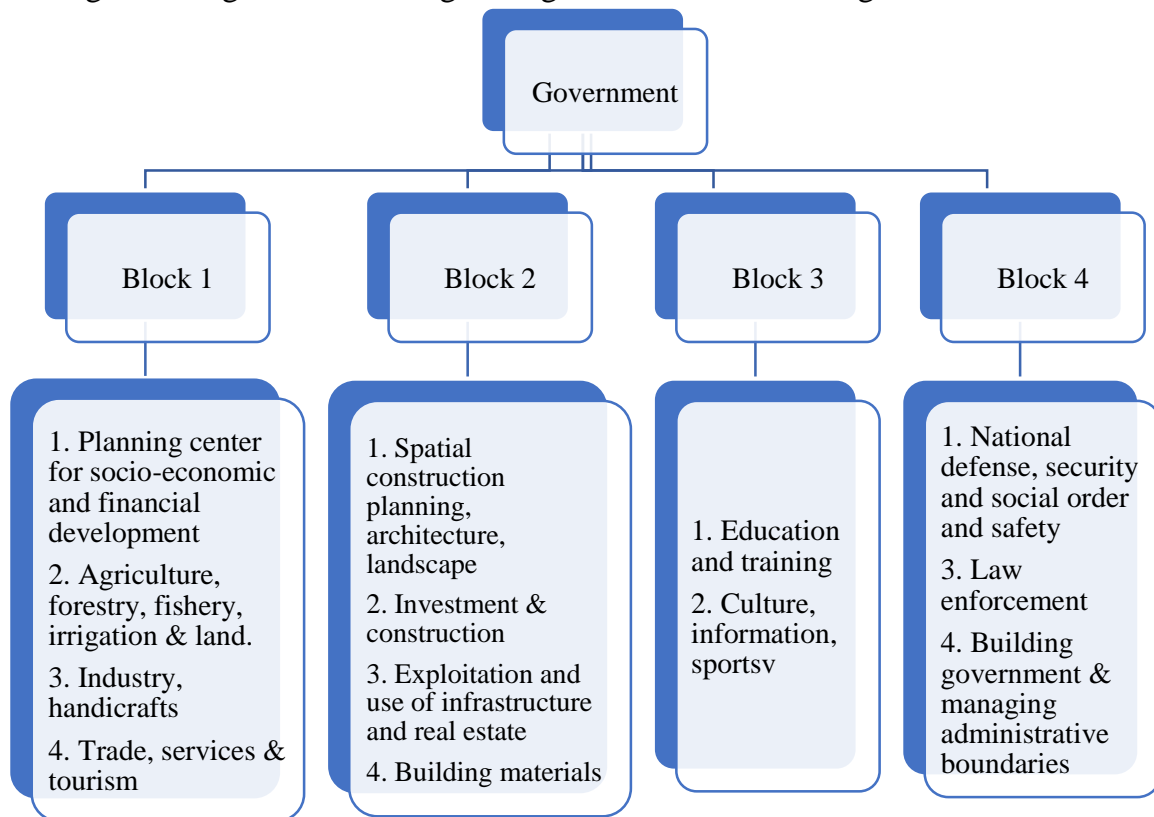


Figure 2.3. The position of space, architecture, and landscape management in urban management.

- *Urban strategy to adapt to climate change:* Ways to respond to climate change are divided into two groups: Adaptation and mitigation. The solutions given are all directed at how to limit and cut down the source of greenhouse gas emissions, which

is the main factor causing the phenomenon of global climate change, and towards finding solutions to adapt to climate change. This will be top priority work for countries affected by climate change.

- *Methods of space management, architecture, and landscape adaptation to climate change:* Including methods: Orienting urban space development on an environmentally friendly basis; Land use planning and urban design; Technical infrastructure system planning; Adapt to rising temperatures; Adapt to floods and storms and adapt to sea level and high tides.

2.1.2. Criteria and trends for urban development capable of adapting to climate change in coastal areas

➤ Criteria for urban areas to be able to adapt to climate change

Criteria for climate change adaptation include: Climate change adaptation urban economic criteria; urban social and cultural criteria to adapt to climate change; environmental criteria - urban ecology to adapt to climate change; criteria for climate change adaptive urban management; criteria for urban infrastructure to adapt to climate change

➤ Trend of urban development capable of adapting to climate change in coastal areas

- Green growth and job creation (focusing on natural resource management, ecotourism, green building development, urban agriculture).

- Urban leadership and management (participatory, collaborative decisionmaking process among stakeholders).

- Strengthening urban-rural linkages (water management, market-oriented agricultural and forestry development, diversification of agricultural products).

2.2. Legal basis

2.2.1. Regulations on management of architectural space and coastal urban landscape

- Legal documents: Construction law; Architectural law...

- Sub-law documents: Decree; Circulars

- National strategies, guidelines and policies of the Party, Government and Prime Minister related to spatial management, architecture and coastal urban landscape

- Related planning projects: Quang Ninh province planning; General plans of 5 coastal urban areas.

2.2.2. Vietnam's policies to respond to climate change

Decision No. 896/QĐ-TTg dated July 26, 2022 of the Prime Minister approving the National Strategy on Climate Change for the period up to 2050 to proactively adapt effectively and reduce the level of vulnerability and loss. and damage caused by climate change; reduce greenhouse gas emissions according to the net zero emission target by 2050, making a positive and responsible contribution to the international community in protecting the earth's climate system; Take advantage of opportunities from climate change response to transform the growth model, improve the resilience and competitiveness of the economy.

2.2.3. Orientation for development of coastal urban system in Quang Ninh province

Coastal urban systems have always been emphasized in Vietnam's development strategies and territorial planning. Develop the coastal urban system according to the following directions:

- + Develop a coastal urban system adapted to climate change.
- + Develop the coastal urban system in a synchronous manner
- + Develop a coastal urban system that harmonizes community benefits.

2.3. Factors affecting the management of space, architecture, and urban landscape of Quang Ninh coastal area

2.3.1. Natural conditions in Quang Ninh

In Quang Ninh, with typical natural conditions of the tropical monsoon climate, hot and humid, with lots of rain and seasonal differentiation, the average air humidity is high. Natural conditions are expressed through the following criteria: Terrain conditions, geographical location; geological structure; weather and climate conditions.

2.3.2. Population size

Population size is expressed through the following criteria: Population growth; population size; population density; customs and practices of the people; living conditions and average income of people.

2.3.3. Economic conditions

Quang Ninh is the province with the most potential for economic development in the Northern region. With advantages in landscape, terrain, bordering Hanoi and other neighboring provinces, it has created a strong development driving force for Quang Ninh province. Economic conditions are expressed through the following criteria: Economic growth; Economic integration trend; Urbanization rate; Financial resources for space management, architecture, and urban landscape.

2.3.4. State institutions and policies

State institutions and policies are expressed through the following criteria: System of legal documents applied in space management, architecture, and urban landscape; programs and policies on attracting investment capital; policies on education and improving people's knowledge; policies for development and application of science and technology; organizational structure of space management apparatus and urban landscape architecture.

2.3.5. Urban planning

Urban planning is the foundation for urban development in general, and regional economic development in particular. Effective urban planning is about creating all conditions for the QGKTCQ to develop smoothly. Urban planning is expressed through the following criteria: Current status of urban planning; urban planning strategy.

2.3.6. Human resources for space management, architecture, and urban landscape

Resources are an indispensable factor for the effective operation of the space, architecture and landscape management apparatus. Organizing an urban management apparatus strong enough in terms of scale and nature, the organization will make wise decisions in the management of space, architecture, and coastal urban landscape to

adapt to climate change. Human resources for space, architecture, and urban landscape management are expressed through the following criteria: Number of human resources; quality of personnel; investments in human resource development

2.3.7. Community participation in space, architecture, and landscape management

Community participation in space, architecture, and landscape management is shown through the following criteria: Community participation in planning management; mechanisms and policies to attract community participation in State planning work.

2.3.8. Science and technology

Quang Ninh Province's planning clearly states that making science and technology the foundation and key driving force in economic growth and sustainable development. Besides, the content of digital transformation is one of two contents that cover all aspects of development as well as the foundation for the province's spatial distribution activities. Science and technology are expressed through the following criteria: Technology in construction; space management technology, architecture, landscape.

2.3.9. Impact of climate change on coastal cities

The impact of climate change on coastal cities is shown through the following criteria: Urban environment; mineral exploitation process; daily life and production activities of urban people; consequences of climate change.

2.4. Results of the investigation on the organization and management of space, architecture, and urban landscape of Quang Ninh coastal area

2.4.1. Factors affecting the management of space, architecture and coastal urban landscape in Quang Ninh province

Through an overview of the work and current situation of space management, architecture and landscape in Quang Ninh province, and consultation with experts, the author has identified groups of factors that have a great influence on the work. management of coastal urban urban areas in Quang Ninh province.

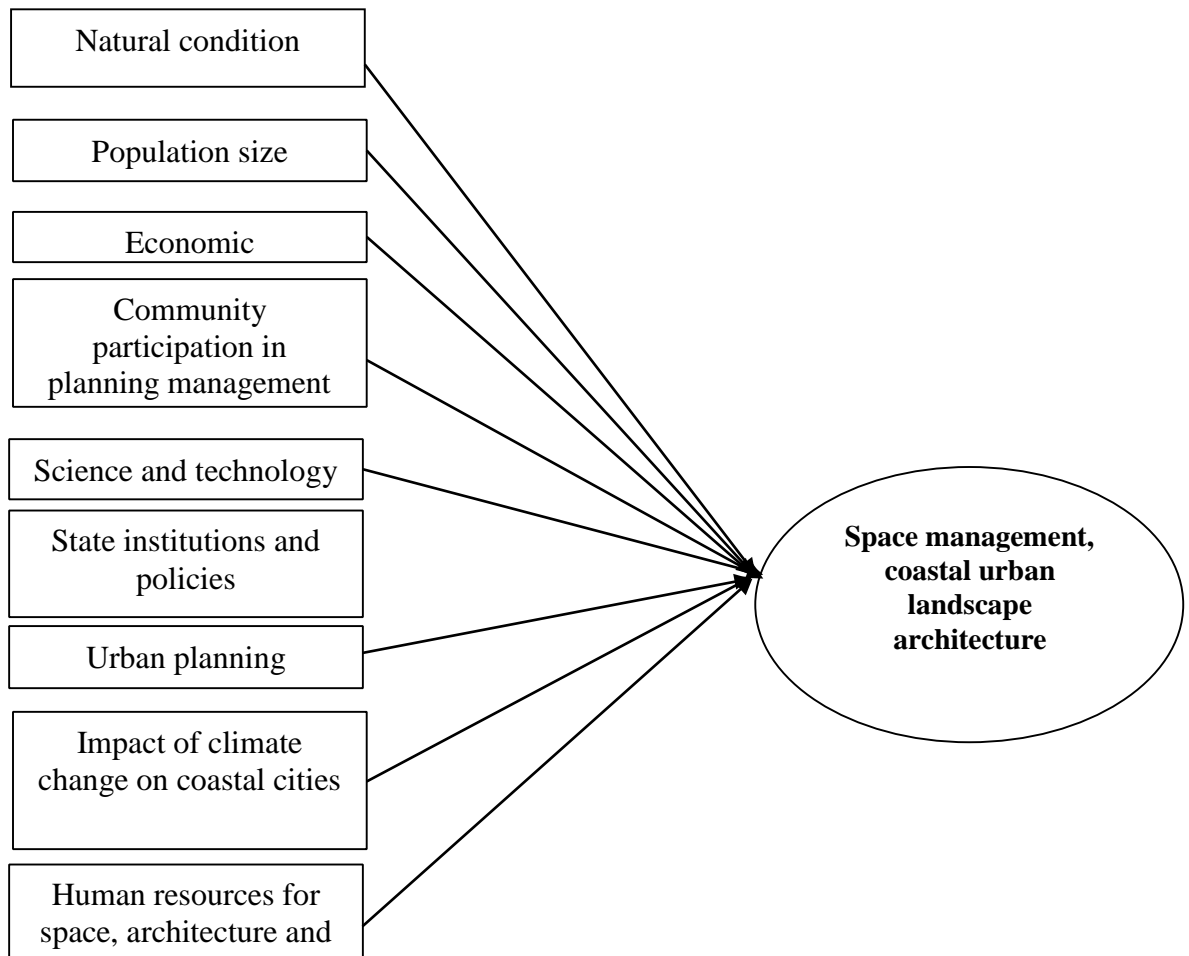


Figure 2.9: Groups of factors affecting space management, architecture, and coastal urban landscape

- Dependent variable is: Results of spatial management and coastal urban landscape architecture.

- The independent variables are 9 factors: (1) Natural conditions; (2) Population size; (3) Economy; (4) Community participation in planning management; (5) Science and technology; (6) State institutions and policies; (7) Urban planning; (8) Impact of climate change on coastal cities; (9) Human resources for space management and landscape architecture.

2.4.2. Survey investigation method

To research the thesis in the most comprehensive way, capturing the characteristics and changes of space, architecture, and coastal urban landscape in the context of climate change, the author combined qualitative research methods. and quantitative research for research topics.

Given the nature and objectives of the research, this study identified 150 valid responses.

4.2.3. Results of the survey ➤

Research model

Within the scope of the topic, the author used an estimated regression model.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9$$

➤ ***Survey and investigation results***

The survey was conducted for 6 months and the results were as follows:

Number of ballots issued: 230 ballots; Number of ballots received: 195 votes and the number of valid votes is 185 votes

The results show the level of influence of the following groups of factors: (1) Group of state policy and institutional factors; (2) Group of urban planning factors; (3) Group of natural conditions; (4) Group of human resources factors for space management, architecture, urban landscape; (5) Group of scientific and technological factors; (6) Group of factors on the impact of climate change on coastal cities; (7) Population size; (8) Economic factor group; (9) Group of factors on community participation in planning management

The calculated result is the Cronbach Alpha coefficient of 0.884. This result proves that the survey completely satisfies the reliability requirements of the scale. **Bảng**

2.1. Cronbach's Alpha coefficient test results

Cronbach's Alpha	No of Items
.884	33

Detailed results are shown in Appendix 7.

2.5. Experience in managing space, architecture, and landscape of coastal cities

2.5.1. Experience in managing space, architecture, and landscape to respond to climate change in Vietnam

➤ *Experience in Da Nang city*

Planning, economic and social development, industry development at city and district levels are integrated and implemented to respond to climate change in the area.

➤ *Experience in Nha Trang city*

Planning work is implemented transparently, with input on planning ideas from domestic and foreign experts, consultants and socio-economic organizations.

2.5.2. Experience in managing space, architecture, and coastal urban landscape to adapt to climate change in the world

➤ *Seoul, Korea*

The Seoul Metropolitan Area, including the major port city of Incheon and Gyeonggi Province, is the second largest metropolitan area in the world after the Tokyo Metropolitan Area, accounting for half of South Korea's population along with more than 1,000,000 foreigners. This place became the economic, cultural and political center of this country. The city plays an important role in Korea's economic development and is considered the origin of the "Miracle of the Han River".

➤ *Singapore*

Singapore is an island nation consisting of the main island and 63 small islands, of which 20 are inhabited, scattered in the Singapore Strait, with an urbanization rate of 100%. Singapore's development strategy is to build the country into a common garden for everyone, in which architectural space and urban landscape are an important part of people's lives. The agency managing the system of architectural space and urban landscape is the National Parks Department.

2.5.3. Lessons learnt

- Decentralize management of space, architecture, and landscape
- Building legal basis
- System of planning projects, regulations and management regulations -
The role of the community

CHAPTER 3: SOLUTIONS FOR SPACE, ARCHITECTURE, AND URBAN LANDSCAPE MANAGEMENT ON THE COASTAL OF QUANG NINH PROVINCE

3.1. Perspectives, goals and principles of space management, architecture, and coastal urban landscape in Quang Ninh province

- Viewpoint: management of coastal urban landscape architectural space in Quang Ninh province is associated with assessing and forecasting the impact of climate change.
- Objective: identify challenges and opportunities of climate change for the development process of industries, fields and localities in Quang Ninh province.
- Principle: The management of space, architecture, and urban landscape must comply with regulations and standards on construction planning according to State regulations, urban planning, urban design and regulations. urban planning and architecture management.

3.2. Some requirements for the management of coastal urban landscape architectural space

- Respect and promote greenery and water surface elements in urban landscape architectural space
- Control of high-rise buildings
- Adaptation to climate change

3.3. Proposing a set of criteria for managing coastal space, architecture, and urban landscape

The thesis proposes 05 groups of criteria to manage space, architecture, and coastal urban landscape to adapt to climate change: (1) Planning; (2) Architectural space organization; (3) Urban landscape; (4) Technical infrastructure (5) Other specific criteria:

- Planning includes: Land use; Construction density and green space and water surface.
- Architecture includes: Urban architectural works; Urban highlight
- Urban landscape includes: Conservation; Construction control; Promoting the architectural spatial form of the area and the ecosystem
- Technical infrastructure includes: Traffic; water supply; Domestic wastewater treatment; Solid waste; Sidewalks and walking paths in public spaces; Energy saving

- Other criteria include: Other urban amenities; Critical infrastructure is resilient to natural disasters; Health and education infrastructure is resilient to natural disasters; Building materials.

3.4. Solutions for space management, architecture, and coastal urban landscape in Quang Ninh Province

3.4.1. Complete the legal framework, tools, and database for spatial management, architecture, and coastal urban landscape

It is necessary to complete and synchronously supplement legal document systems as well as design standards and regulations that address issues of response to climate change in project design, especially for climate change phenomena. The main effects are flooding, urban heat islands, wind and storms in urban areas and heat radiation. Besides, it also aims to require more suitable designs to rebuild works that have been destroyed by incidents after natural disasters. Develop regulations to control the implementation of planning and adjust and improve construction works for the purpose of managing local risks of climate change.

3.4.2. Review, adjust and implement planning

Review master plans and sector plans in urban areas facing rising sea levels. All plans and projects in coastal areas and estuaries must specifically take into account geomorphological stability and sea level factors. For example, in Ha Long city, Cao Xanh, Ha Khanh, and Ha Lam areas are the areas with the most flooding in Ha Long. Thus, in zoning planning, it is necessary to pay attention to measures to adapt to this phenomenon.

3.4.3. Solutions for zoning and spatial management of coastal cities and implementation procedures

Zoning and spatial management of coastal urban areas

Table 3.2. Spatial zoning, architecture, coastal urban landscape of Quang Ninh Province

No	Region	Regional nature	Setback distance (calculated from the tide line)	Allowed construction	Level of vulnerability due to climate change
1	Region 1	Ecological buffer area	$\geq 50 - 100$ m	Construction is prohibited	I
2	Region 2	Area close to the sea	$\geq 100 - 200$ m	Grade IV Construction	II
3	Region 3	Central area	$\geq 200 - 300$ m	Construction \leq level III	III
4	Region 4	Peripheral area of the city	≥ 300 m	Construction \leq level II	IV
5	Region 5	Border area	≥ 500 m	Grade I Construction	V

3.4.4. Management solutions for urban areas and architecture

To effectively manage architectural works, it is necessary to restructure coastal space towards a green tourism economy, adapt to climate change and inherit old structures to preserve cultural heritage and institutions. Specific solutions are based on the approved detailed planning, complying with the urban space management regulations of the urban government, the set of criteria for space management, coastal urban landscape architecture adapted to climate change (in section 3.4) and current regulations and standards (QCVN 01: 2021/BXD, TCVN 9411: 2012...).

- Strict regulations on space
- Regulations on spatial morphology, architecture, and coastal urban landscape
- Construction of works adapted to climate change
- Improve public works
- Prioritize colors and materials with high durability
- Strictly control and manage the spatial organization of conservation areas, monuments and landscapes

3.4.5. Environmental landscape management solutions

- Increase green space: Green trees for public use (green strips of streets, squares, parks, flower gardens, walking gardens..., including water surface areas located within the premises of works This area and the green landscape area on Ha Long Bay, Bai Tu Long Bay and square and park areas) need to be planned and arranged properly.
- Traffic works and technical infrastructure: Strengthen the development of the public transport system; Encourage the development of personal vehicles, bicycles and electric vehicles; Limit motor vehicles, minimize emissions into the environment (the proportion of people participating in public transport by 2035 is at least 35%; people using bicycles and electric vehicles $\geq 20\%$).

3.4.6. Solutions for organizational structure and management model

- Proposal to establish the Urban Landscape Architectural Space Management Board, a division separated from the Urban Management Department under the City, with the task of managing, renovating and beautifying urban areas, Maintaining, renovating and beautifying the architecture of street fronts, streets, residential areas, squares, technical infrastructure, social infrastructure and environment according to the annual plan list of the City People's Committee deliver.

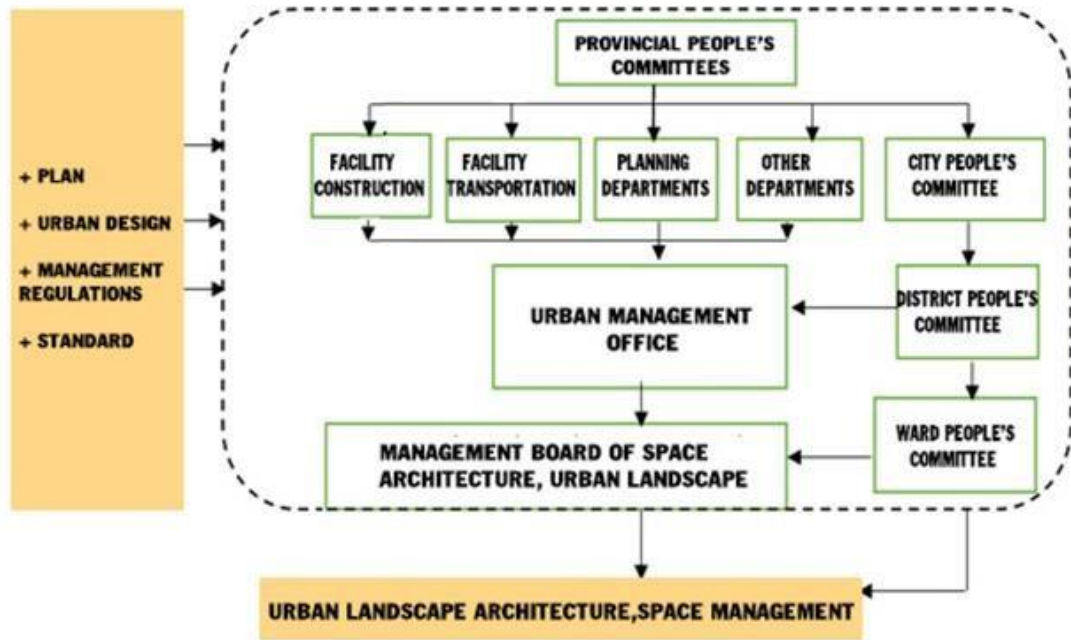


Figure 3.15. Model of coastal urban landscape architectural space management model
[Source: Author's recommendation]

- Improve the capacity of staff implementing construction planning, improve the ability to integrate and integrate elements to respond to climate change in planning and implementation.

3.4.7. Community participation in space, architecture and landscape management

- Mobilize community participation in planning work
- Mobilize community participation in investment, construction and exploitation
- Mobilize community participation in inspection and supervision

3.5. Pilot application of research results on space management, architecture, and landscape of Ha Long city

□ Introduction - Ha Long city

Ha Long City becomes a class I urban area directly under the province with the largest area in the country with a total land area of 1,119.36 km².



Figure 3.18. Ha Long city planning map in central area

□ Management of space, architecture, and landscape of Ha Long city

In addition to the general regulations proposed in section 3.4.3, Ha Long city needs additional solutions such as:

Proposed organizational structure for space, architecture and landscape management as follows:

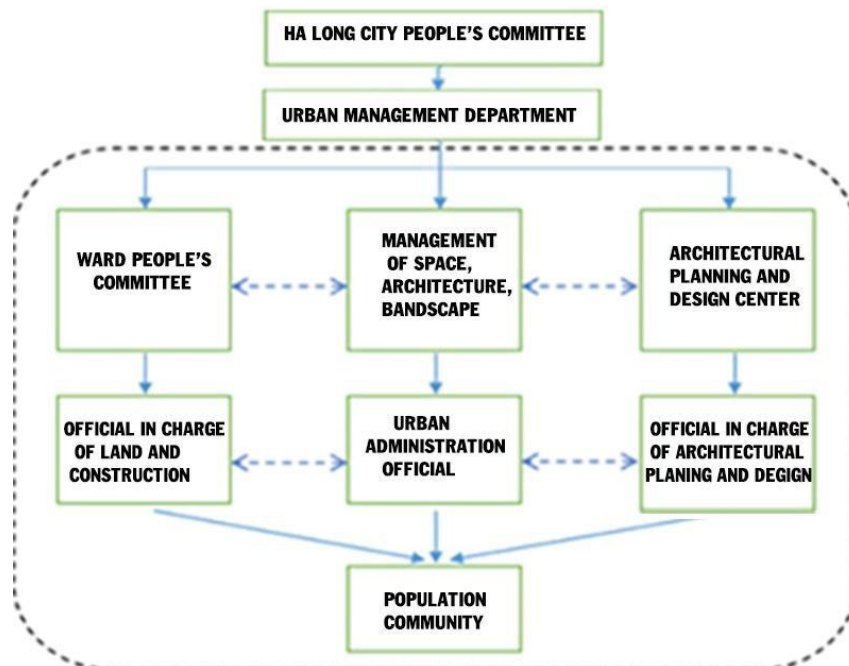


Figure 3.20. Proposal to build a space, architecture and landscape management apparatus in Ha Long City

Proposal to divide Ha Long City's urban space into 5 spatial, architectural, and landscape zones to adapt to climate change including:

- + Zone 1 - Strict conservation zone;
- + Region 2 - Area near the sea;
- + Region 3: Central urban area;

+ Region 4-5: Peripheral and border areas (Mountainous areas).

The regions are managed according to general principles and solutions for coastal urban areas in Quang Ninh province. Besides, solutions for space management and landscape architecture for each specific region

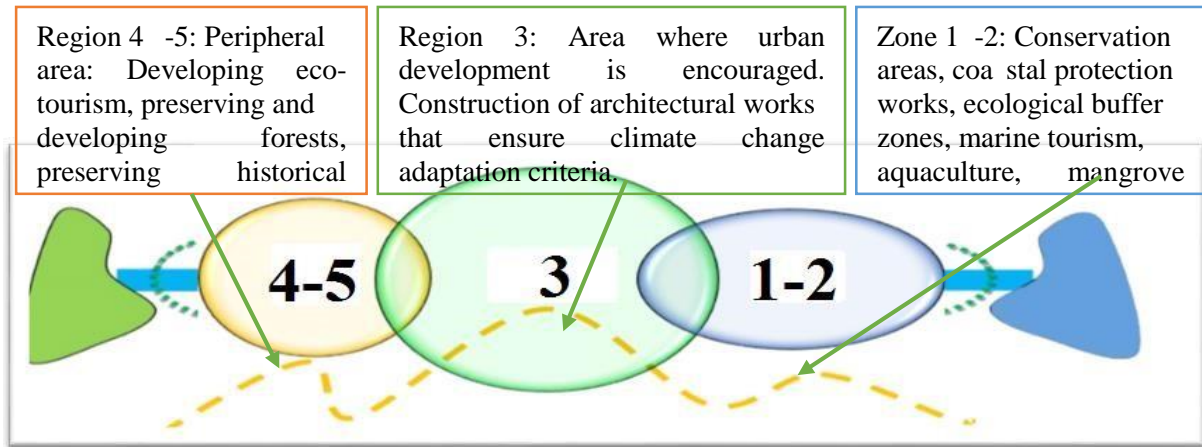


Figure 3.22. The spatial structure of coastal urban areas ensures adaptation to climate change

3.6. Discuss research results

3.6.1. Feasibility of solutions for managing space, architecture, and urban landscape of Quang Ninh coastal area

The thesis proposes very specific groups of proposed solutions detailing each solution, indicators, clarifying zoning, spatial management control, and urban landscape architecture for coastal tourism adapting to climate change.

3.6.2. Efficiency in space management, architecture, and urban landscape of Quang Ninh coastal area

The proposed solution is clear in theory as well as giving very specific details of the solution, criteria, clarifying the control zoning in the coastal urban area of Quang Ninh, giving a location where principles can be built. to allow construction and requirements for coastal urban architectural forms to adapt to climate change. In addition, the thesis's proposals do not stop at management requirements and content but include the development of a set of criteria to be implemented and specific processes that contribute to perfecting the policy framework and serving as a basis. to develop management regulations and supplement the management content of architectural space and landscape of coastal urban areas.

3.6.3. Practicality and widespread application of solutions for space management, architecture, and coastal urban landscape

* Practicality of the thesis

Through surveying and analyzing the current status of the area, and based on the instructions for classifying space, architecture, and landscape of coastal urban areas; Zoning and managing coastal urban areas, the thesis quickly identified specific management solutions including: Conservation and renovation; Investment and construction; Exploitation and use of space, architecture, and landscape in coastal cities. The next step, based on the set of criteria, provides specific groups of solutions.

** Apply replication*

Because the thesis is researched, inherited and integrated from scientific theory and practice

Lessons for developing urban planning and architecture in the world and in Vietnam should be about logic

Practical arguments, perspectives, principles, models, criteria and solutions can be widely applied in urban areas with similar conditions in the country.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Vietnam possesses a long coastline with many rich natural landscapes, thousands of large and small islands and hundreds of white sand beaches stretching from North to South, these are extremely favorable conditions for developing urban areas. Coastal town reaching out to the world. Coastal areas, including Quang Ninh, have great potential for natural landscapes and indigenous culture that are favorable for tourism development. Coastal cities provide services, infrastructure and labor resources for marine tourism logistics. Therefore, coastal urban development is one of the important contents in the strategic goal of developing Vietnam's marine economy, in which coastal urban areas serving tourism play a core role.

Results achieved of the thesis

- The thesis has identified 9 groups of factors affecting the management of space, architecture, and coastal urban landscape in Quang Ninh Province. Among them, the group of factors that have the greatest influence on the management of coastal space, architecture, and urban landscape in Quang Ninh Province are: (1) The group of institutional and policy factors of the state; (2) Group of urban planning factors; (3) Group of natural conditions; (4) Group of human resources factors for space management, architecture, urban landscape; (5) Group of scientific and technological factors; (6) Group of factors on the impact of climate change on coastal cities; (7) Population size; (8) Economic factor group; (9) Group of factors on community participation in planning management

- Propose a set of criteria for spatial management, architecture, and coastal urban landscape to adapt to climate change.

- Propose 7 groups of solutions for spatial management, architecture, and coastal urban landscape of Quang Ninh Province to adapt to climate change.

- Pilot application of research results on space management, architecture, and landscape adaptation to climate change for Ha Long city.

Recommendations

- For the central government: Review and complete the system of relevant legal documents, regulations and standards for landscape and related architectural space to strictly control architectural planning of urban areas nationwide. countries, especially coastal cities.

- For the People's Committee of Quang Ninh province: The provincial/city government needs to coordinate closely with the Ministry of Construction to develop a

coastal urban upgrading program and an Action Plan to upgrade coastal urban areas to adapt to climate change for Quang Ninh in the coming time. framework of the National Urban Upgrading Program from time to time. In particular, architectural and landscape networks such as squares, parks, flower gardens, and playgrounds at all levels are an inseparable part. This allows for a comprehensive review of how to best use existing public land and measures to create new public land that meets different public priorities.

- For Investors: Strictly implement the Province's regulations on urban architectural planning and management of coastal cities.

**LIST OF PUBLISHED SCIENTIFIC WORKS
RELATED TO THESIS TOPIC**

Scientific article

1. *Đào Phương Nam (2019); Management of landscape architectural space in Ha Long city, Quang Ninh* - Construction and Urban Magazine No. 54/2017 - Ministry of Construction - **ISSN18593119**

Scientific seminar

1. *Đào Phương Nam (2018); Climate change – challenges to the urban construction planning management of coastal cities in Quang Ninh province* – Proceedings of the 2018 Vietnam Republic of Korea International Seminar – Construction Publishing House – **ISBN 978-604-82-2696-1**
2. *Đào Phương Nam (2018); Some Solutions for Management of Space Architecture – Urban Landscape of Quang Ninh Province in Response to Climate Change* – 2023 Korea-Vietnam International Conference for Regional Development – The Korean Regional Development Association - **ISBN 97911-983847-0-6**